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| 10/763,500      | 01/23/2004  | Jeff Moler           | VTE-150-C           | 7226             |

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EXAMINER

LOPEZ, FRANK D

ART UNIT PAPER NUMBER

3745

DATE MAILED: 02/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |                                     |  |
|------------------------------|--------------------------------------|-------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/763,500 | <b>Applicant(s)</b><br>MOLER ET AL. |  |
|                              | <b>Examiner</b><br>F. Daniel Lopez   | <b>Art Unit</b><br>3745             |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>5 IDSs in 04</u> . | 6) <input type="checkbox"/> Other: ____.  |

### ***References***

Five IDSs were filed in March 22, 2004, April 15, 2004, May 3, 2004, August 2, 2004 and December 10, 2004, which have been considered. Some of the Other references filed March 22, 2004, were incomplete. High Speed Servo Pneumatic Actuator Systems and Research on the Continuous Positioning Control to Servo-Pneumatic System had only a summary and abstract, respectively. None of the drawings of Modeling and Simulation of a Servo-Pneumatic Gripper were reproduced. Only one page of High Steady State Accuracy Pneumatic Servo Positioning System with PVA/PV Control and Friction Compensation was printed. These references were reviewed only inasmuch as was available from the applicant.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the means biasing the piston toward a centered position (e.g. claim 9) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

Claims 1-30 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1 line 10-11 “at least one discrete position sensor located adjacent a midpoint of the fluid operated cylinder”, claim 10 line 11-12 and claim 19 line 10 having similar language are confusing, since the disclosure indicates that there is only one position sensor located at the midpoint. Suggest that --, said at least one position sensor includes a position sensor—be added after “sensor” of line 10. Dependent claims (e.g. claims 2 and 6) should be similarly modified.

In claim 1 line 14, claim 20 line 13 and claim 23 line 13 “a control program operably connected to...valve” and claim 10 line 16 “controlling actuation of the at least two valves...with a control program operably connected to the at least two valves” are confusing, since a control program is a set of instructions. Suggest that --controller having a-- be added before “control program” of line 14. Dependent claims (e.g. claims 7 and 8) should be similarly modified. In

In claim 2 line 3 and 6 line 3-4 “a fluid operated sensor located adjacent a midpoint”; claim 11 line 2-3, claim 15 line 3-4, claim 20 line 2-3, and having similar language are confusing, since it appears to be previously claimed (claim 1 line 10-11).

Claims 10-18 are confusing, since the limitations are in the form of steps of a method, but the claim is characterized as a system. Suggest that the preamble be modified to claim a method.

Claims not specifically mentioned are indefinite, since they depend from one of the above claims.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject

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matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Claims 23, 25 and 26 are rejected under 35 U.S.C. § 103 as being unpatentable over Stephenson et al in view of Rector et al. Stephenson et al discloses an apparatus for controlling a position of a fluid cylinder (16, 36), having first and second expandable chambers (e.g. 18, 19), defined by a piston (e.g. 15), adjacent first and second ends, respectively, of the cylinder, comprising first and second pressure sensors (e.g. 29, 30, respectively) associated with the first and second chambers, respectively; first and second electrically actuated proportional flow valves (e.g. 21, 22, respectively) for selectively and proportionally controlling flow into and out of, respectively, of the first chamber; a controller having a control program operably connected to the valves and pressure sensors, to control the valves in response to pressures measured by the pressure sensor; but does not disclose that there is at least one discrete position sensor for sensing a discrete predetermined position of the piston, wherein the position sensor is connected to the controller, such that the valve is controlled in response to the position measured by the position sensor.

Rector et al teaches, for an apparatus for controlling a position of a fluid cylinder (16), having first and second expandable chambers (17, 18), defined by a piston, adjacent first and second ends, respectively, of the cylinder, comprising electrically actuated flow valve (36) for controlling flow into and out of the first chamber; and a controller (73) having a control program operably connected to and controlling the valve; that there is at least one discrete position sensor (e.g. 74) for sensing a discrete predetermined position of the piston, wherein the position sensor is connected to the controller, such that the valve is controlled in response to the position measured by the

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position sensor, for the purpose of reducing the speed of the piston when it nears its end of stroke position (column 1 line 66- column 2 line 3).

Since Stephenson et al and Rector et al are both from the same field of endeavor, the teachings disclosed by Rector et al would have been recognized in the pertinent art of Stephenson et al. It would have been obvious at the time the invention was made to one having ordinary skill in the art to include at least one discrete position sensor for sensing a discrete predetermined position of the piston of Stephenson et al, wherein the position sensor is connected to the controller, such that the valve is controlled in response to the position measured by the position sensor, as taught by Rector et al, for the purpose of reducing the speed of the piston when it nears its end of stroke position.

Claims 1-4, 10-13, 19, and 23-26 are rejected under 35 U.S.C. § 103 as being unpatentable over Stephenson et al in view of GB 2203195. Stephenson et al discloses an apparatus for controlling a position of a fluid cylinder (16, 36), having first and second expandable chambers (e.g. 18, 19), defined by a piston (e.g. 15), adjacent first and second ends, respectively, of the cylinder, comprising first and second pressure sensors (e.g. 29, 30, respectively) associated with the first and second chambers, respectively; first and second electrically actuated proportional flow valves (e.g. 21, 22, respectively) for selectively and proportionally controlling flow into and out of, respectively, of the first chamber; a controller having a control program operably connected to the valves and pressure sensors, to control the valves in response to pressures measured by the pressure sensor; but does not disclose that there is first and second position sensors located adjacent a midpoint of the operating stroke and adjacent an end of the travel of the piston, wherein the position sensors are connected to the controller, such that the valve is controlled in response to the positions measured by the position sensors.

GB 2203195 teaches, for an apparatus for controlling a position of a fluid cylinder (10), having first and second expandable chambers (13, 14), defined by a piston (11), adjacent first and second ends, respectively, of the cylinder, comprising electrically

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actuated flow valve (e.g. 20) for controlling flow into and out of the first chamber; and a controller (24) having a control program operably connected to and controlling the valve; that there is first and second position sensors (26, 25, respectively) located adjacent a midpoint of the operating stroke and adjacent an end and an opposite end of the travel of the piston, respectively, for sensing discrete predetermined positions of the piston, wherein the position sensors are connected to the controller, such that the valve is controlled in response to the positions measured by the position sensors, for the purpose of reducing the speed of the piston when it nears engagement of the work (27, page 7 line 34- page 8 line 7).

Since Stephenson et al and GB 2203195 are both from the same field of endeavor, the teachings disclosed by GB 2203195 would have been recognized in the pertinent art of Stephenson et al. It would have been obvious at the time the invention was made to one having ordinary skill in the art to include at least one discrete position sensor for sensing a discrete predetermined position of the piston of Stephenson et al, wherein the position sensor is connected to the controller, such that the valve is controlled in response to the position measured by the position sensor, as taught by GB 2203195, for the purpose of reducing the speed of the piston when it nears its end of stroke position.

Claims 1-8, 10-17 and 19-29 are rejected under 35 U.S.C. § 103 as being unpatentable over Stephenson et al in view of Morita et al, and Rector et al. Stephenson et al discloses an apparatus for controlling a position of a hydraulic type fluid cylinder (16, 36), having first and second expandable chambers (e.g. 18, 19), defined by a piston (e.g. 15), adjacent first and second ends, respectively, of the cylinder, and method, comprising first and second pressure sensors (e.g. 29, 30, respectively) associated with the first and second chambers, respectively; first, second, third and fourth electrically actuated proportional flow valves (e.g. 21, 22, 23, 24, respectively) for selectively and proportionally controlling flow into and out of, respectively, of the first and second chambers, respectively; a controller having a control program operably connected to the valves and pressure sensors, to control the valves in response to

pressures measured by the pressure sensor; but does not disclose that the valves are connected to a manifold having an inlet port an exhaust port and an outlet port; that there is first, second and third position sensors located adjacent a midpoint of the operating stroke and adjacent an end and an opposite end of the travel of the piston, respectively, for sensing discrete predetermined positions of the piston, wherein the position sensors are connected to the controller, such that the valve is controlled in response to the positions measured by the position sensors; or that the controller initializes a home position when the piston is sensed by the first position sensor, and calculates a required pressure to move the piston a desired distance from the midpoint position.

Morita et al teaches, for an apparatus for controlling a position of a air type fluid cylinder (34), having first and second expandable chambers (34a, 34b), defined by a piston (36), adjacent first and second ends, respectively, of the cylinder, and method, comprising electrically actuated flow valve (30) for controlling flow into and out of the first chamber; and a controller (90) having a control program operably connected to and controlling the valve; that there is first, second and third position sensors (e.g. 38, 42, 44, respectively) located adjacent a midpoint of the operating stroke and adjacent an end and an opposite end of the travel of the piston, respectively, for sensing discrete predetermined positions of the piston, wherein the position sensors are connected to the controller, such that the valve is controlled in response to the positions measured by the position sensors, that the controller initializes a home position when the piston is sensed by the first position sensor (by steps s6 and s7 of fig 5), and calculates a required pressure to move the piston a desired distance from the midpoint position (e.g. steps s8-s13, fig 5 and 6), for the purpose of stopping the piston at its end of stroke position in a shock free state, without requiring any position adjustment of the position sensors (column 1 line 54-58).

Rector et al teaches, for an apparatus for controlling a position of a hydraulic type fluid cylinder (16), having first and second expandable chambers (17, 18), defined by a piston, adjacent first and second ends, respectively, of the cylinder, and method, comprising electrically actuated flow valve (36) for controlling flow into and out of the



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first chamber; and a controller (73) having a control program operably connected to and controlling the valve; that there is at least one discrete position sensor (e.g. 74) for sensing a discrete predetermined position of the piston, wherein the position sensor is connected to the controller, such that the valve is controlled in response to the position measured by the position sensor, for the purpose of reducing the speed of the piston when it nears its end of stroke position (column 1 line 66- column 2 line 3), to limit shocks when stopped at its end position (e.g. column 1 line 15-21).

Since Stephenson et al discloses a hydraulic type cylinder, since Rector et al teaches a need for limiting shocks when a piston of a hydraulic type cylinder approaches an end position, and since Morita et al teaches a method of limiting shocks when a piston of a fluid cylinder approaches an end position; one having ordinary skill in the art would recognize that the purpose disclosed by Morita et al would have been recognized in the pertinent art of Stephenson et al, due to the teachings of Rector et al. It would have been obvious at the time the invention was made to one having ordinary skill in the art to include first, second and third position sensors located adjacent a midpoint of the operating stroke and adjacent an end and an opposite end of the travel of the piston of Stephenson et al, respectively, for sensing discrete predetermined positions of the piston, wherein the position sensors are connected to the controller, such that the valve is controlled in response to the positions measured by the position sensors, with the controller initializing a home position when the piston is sensed by the first position sensor, and calculates a required pressure to move the piston a desired distance from the midpoint position, as taught by Morita et al, for the purpose of stopping the piston at its end of stroke position in a shock free state, without requiring any position adjustment of the position sensors.

Claim 30 is and claims 9, 18 and 30 are rejected under 35 U.S.C. § 103 as being unpatentable over Stephenson et al in view of Rector et al, as applied to claim 23 above, and over Stephenson et al in view of Morita et al. and Rector et al, as applied to claim 1, 10 and 23, respectively, above, respectively, and further in view of Neilson et al. The modified Stephenson et al discloses all of the elements of claims 9, 18 and 30,

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but does not disclose that there is means for biasing the piston toward the midpoint position.

Neilson et al teaches, for an apparatus for controlling a position of a hydraulic type fluid cylinder (12), having first and second expandable chambers, defined by a piston (14), adjacent first and second ends (20, 26), respectively, of the cylinder, and method, comprising a flow valve (72) for controlling flow into and out of the first chamber; that there is means for biasing (30) the piston toward the midpoint position.

Since the cylinders of Stephenson et al and Neilson et al are functionally equivalent in the piston art, it would have been obvious at the time the invention was made to one having ordinary skill in the art to add a means for biasing the piston of Stephenson et al toward the midpoint position, as taught by Neilson et al, as a matter of engineering expediency.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Lopez whose telephone number is 571-272-4821. The examiner can normally be reached on Monday-Thursday from 6:15 AM -3:45 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Look, can be reached on 571-272-4820. The fax number for this group is (703) 872-9306. Any inquiry of a general nature should be directed to the Help Desk, whose telephone number is 1-800-PTO-9199.



F. Daniel Lopez  
Primary Examiner  
Art Unit 3745  
February 14, 2005